PROBATION OFFICERS' SCHEMAS OF OFFENDERS:
CONTENT, DEVELOPMENT, AND IMPACT ON TREATMENT DECISIONS

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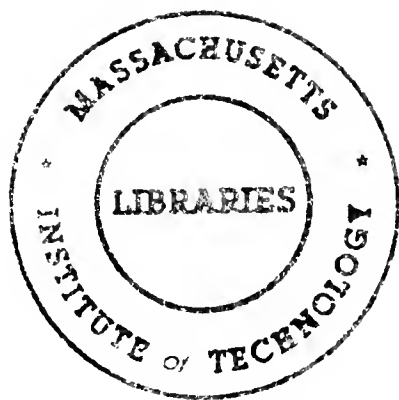July, 1984   WP# 1560-84

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ABSTRACT

It is important that schema research utilize tasks with rich information, direct relevance to behavior, and individual differences in schema content due to experience. Three studies investigated schemas of criminal types held by Probation Officers (POs). In Study 1, semi-structured interviews revealed ten schemas shared by a high proportion of POs that included information about criminal behavior, social histories, attributions, treatment and supervisory strategies, and prognoses. Experienced POs produced fewer but richer (more detailed) schemas than inexperienced POs. In Study 2, POs and clerical staff sorted items of information into case descriptions to validate the schemas. POs consistently reproduced schemas, but laypeople did not. Among POs, schema detail depended on experience with instances of the case type. Study 3 showed that ·schematic knowledge affects probation decisions. Cases fitting a schema were processed more quickly, easily, and confidently than mixed schematic or real cases. Theoretical and practical issues of schematic processing, expertise, and decision aids are discussed.

PROBATION OFFICERS' SCHEMAS OF OFFENDERS:

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The introduction of schemas and other concepts representing the organization of knowledge (prototypes, scripts, frames), into social psychology has generated widespread interest and research (e.g., Hastie, 1981; Taylor & Crocker, 1981). Using these concepts, researchers have been able both to represent aspects of knowledge, including consistency, relevance, and implicit theories (Fiske, 1981) and to describe with the same language the processes that draw on given information (Bower, Black, & Turner, 1979; Cantor & Mischel, 1979). Substantial progress has been made in identifying how schemas guide the acquisition, encoding, and recall of information, and the inferences generated from that information.

Although the schema literature has blossomed in the past few years, existing research has been criticized as limited in several ways (Fiske & Linville, 1980; Hastie, 1981; Taylor & Crocker, 1981). Studies have focused on consensual schemas presumably shared by everyone, presented information in brief, stylized verbal descriptions, and relied on cognitive tasks not directly related to realistic behaviors. The purpose of this paper is to extend schema research by describing a program of studies investigating schemas that are acquired through experience in a complex, natural situation, and that have direct effects on decisions and actions in the real world. We begin with a discussion of the role of experience and then introduce the task environment of probation officers' roles in which shcemas are studied.

Schemas and Experience

Schemas are abstract cognitive representations of organized prior knowledge, extracted from experiences with specific instances (Fiske &

Linville, 1980). Although experience is central to schemas, researchers have concentrated on schemas that are assumed to be shared by everyone through a common set of experiences represented in trait labels (e.g., extrovert, Cantor & Mischel, 1979), social roles (e.g., librarian, Cohen, 1981), or stereotypes (e.g., elderly person, Brewer, Dull, & Lui, 1981). Variations in schema content, availability, and use are treated as error.

One would expect to find that variations in experience would lead to important differences in schema content and application, as suggested in work on political schemas (Fiske & Kinder, 1981; Fiske, Kinder, & Lartner, 1983). Experts should have more detailed and complete schemas than novices, and should have more sophisticated strategies or procedures for using their knowledge. Indeed, the growing literature on expertise focuses on the experts' extensive and organized knowledge base and highly-efficient heuristic strategies as the explanation for enhanced performance (Chase & Simon, 1973; Johnson, 1980; Larkin, McDermott, Simon, & Simon, 1980).

By focusing schema research on consensual schemas, and by using simple verbal descriptions in laboratory tasks (e.g., recall of trait lists), researchers have minimized the importance of experience. Schemas developed through actual experience would be expected to involve complex knowledge beyond one-word descriptors, to be built around social events and roles, and to exhibit differences from what is revealed in laboratory studies (Cohen, 1981; White & Carlston, 1983). The most appropriate way to investigate such schemas would be with tasks similar to those that experienced people naturally perform. This includes relating schematic processing to interpersonal behaviors of true consequence. Fiske and Linville (1980) call the link between schematic processing and behavior "an untapped gold mine" (p. 549) for social cognition research.

Probation Officers' Schemas

The present studies are designed to address the above limitations of schema research by examining schemas acquired through role-based experience, investigating differences between experts and novices, and demonstrating the impact of schemas on judgments central to the experts' role. Probation officers' schemas of criminals were chosen for several reasons. First, probation officers are expected to acquire and utilize information about probationers for the purpose of rendering decisions regarding treatment (e.g., counseling and referrals) and monitoring (e.g., frequency of reporting). These decisions are based on knowledge of the characteristic behaviors and traits of various types of offenders. Second, research on diagnostic judgments among psychiatrists (Cantor, Smith, French, & Mezzich, 1980) and parole board members (Carroll, Galegher, & Wiener, 1982; Carroll & Wiener, 1982) supports the idea that diagnosis consists of the classification of clients into "fuzzy categories" that contain many different kinds of information and produce inferences used to devise treatment plans. In particular, we should note that diagnosis involves causal reasoning about how the client developed his or her problems and what prognosis exists with or without treatment (cf. Brickman et al., 1983).

Additionally, a previous study provided preliminary evidence for the existence of schemas of probationers. In a series of interviews aimed at probation officers' evaluations of offenders for risk classification and treatment, Lurigio (1981) reported that POs describe such factors as drug use, unemployment, influence of associates, absence of family ties, and immaturity as causes of failure to complete probation. For example, the "drug offender" was offered as a type of probationer who is highly unlikely to satisfactorily complete probation. Knowledge of this category of offender included

presumptions about the probationer's interpersonal relationships, prior criminal history, reasons for criminal activity and drug use, and a prognosis for rehabilitation.

Hypotheses and Overview of Research

We therefore hypothesize that probation officers develop through experience a rich knowledge base about offenders. We propose that this knowledge is organized schematically and therefore guides the acquisition of information about a probationer, the creation of inferences about information not directly acquired, and the development of treatment and supervision plans. Because schemas are developed and modified through experience (Crocker & Weber, in press), we propose that POs with greater experience possess more extensive schemas than those with less experience. The possession of schematic knowledge should affect not only the nature of treatment decisions, but also how quickly and confidently cases can be processed.

Three studies were conducted. Study 1 elicited schemas through semi-structured interviews with POs. The number and content of schemas were compared for expert and novice POs and officers from Criminal and Municipal assignments. Study 2 used an information-sorting procedure to test whether subjects would reconstruct cases from information items in a manner consistent with the schemas found in Study 1. Expert and novice, Criminal and Municipal officers and nonexpert clerical staff served as subjects. We hypothesized that expert POs would reproduce schematic cases better than novices who, in turn, would do better than the clerical staff. Study 3 examined the effects of schematic information on ease and confidence of decisionmaking. Expert POs were given case information designed to be schematic or non-schematic and were asked to make evaluations that are typical of their job. We hypothesized that schematic cases would be evaluated more easily and confidently.

The primary purpose of Study 1 was to identify schemas used by probation officers. This was a necessary precursor to studies validating the schemas and assessing their impact on decisions. Secondarily, Study 1 explored how differences between experience levels and assignments of POs influence the content of schemas.

Method

Subjects

Forty probations officers of the Cook County (Chicago) Adult Probation Department responded to requests to volunteer as subjects. The sample included equal numbers of male and female, white and non-white, high and low experience, and Criminal and Municipal officers. Experience levels were defined by a median split of years employed as a probation officer: three or more years was designated "expert" and less than three years "novice." The range of experience was from six months to fifteen years. Municipal division officers supervise a mostly-suburban caseload of first-time misdemeanants, white-collar criminals, petty thieves, and shoplifters. Criminal division officers supervise an inner-city caseload more likely to contain felons, recidivists, gang members, and members of minority groups.

Procedure

Individual semi-structured interviews were conducted with each respondent. Subjects were informed that the study was an exploration of the kinds of categories or groupings officers utilize in differentiating among their cases. It was made explicit that the study focused on officers' subjective assessments or judgments as opposed to any systematic strategies they may employ in classifying their cases for supervision.

Topic areas were developed from a conceptual analysis of probation officers' tasks. For each schema mentioned, five content domains were tapped

with questions differing somewhat among respondents: (1) <u>Criterial</u>
<u>Attributes</u>--What are the basic or core elements of this type of probationer?
What traits differentiate the probationer from other categories which are
closely related? (2) <u>Report Demeanor</u>--Is the probationer regular in his/her
reporting? On report days, is the probationer respectful, discourteous,
cooperative, etc.? (3) <u>Supervision</u>--How often is the probationer required to
report? What kinds of extra-departmental services are recommended in the
treatment of the probationer? (4) <u>Attributions</u>--Why do you think this type of
probationer became involved in criminal activity? Is the cause of criminal
behavior temporary or permanent? (5) <u>Prognosis</u>--Is the probationer likely to
become involved in future criminal activity? What is the probability that the
probationer will violate the conditions of his/her sentence?

<div align="center">Results and Discussion</div>

Schemas

Descriptions provided by POs were considered to be "schemas" if they
were: (1) "basic level" categories (Rosch, 1977) applicable to a medium-range
proportion of the PO's caseload (more than a few offenders but not everyone),
(2) logically-ordered and internally-consistent, such that the PO could
sensibly address each of the five content domains, and (3) not derived from
textbook typologies or Judges' directives, in which we had no interest. By
these criteria, subjects produced between 3 and 9 schemas. Expert POs
produced an average of 4.1 schemas, significantly less than the average of 4.8
schemas by the novices [$t(38)=2.08$, $p < .05$]. Criminal and Municipal officers
did not differ in number of schemas, nor did they differ in any of the
subsequent analyses. For simplicity, we do not report these tests.

Two POs were considered to have described the same schema if they gave
essentially the same descriptions of Criterial Attributes <u>and</u> gave matching
answers on at least two of the four remaining content domains. By this

criterion, the 179 total schemas could be sorted into 16 distinct types. There were ten schemas each reported by at least 13 (32.5%) of the respondents. The remaining six schemas were reported by 7 or fewer POs, a marked decrease in consensus. Table 1 gives identifying labels and brief descriptions of the ten consensual schemas.

Insert Table 1

From Table 2, which gives the number of expert and novice POs reporting each schema, it can be seen that POs with different amounts of experience tended to report different schemas. Novices not only reported more schemas than did experts, but also produced 85% of the non-consensual schemas. In contrast, experts restricted their descriptions to more consensual, and fewer, schemas.

Insert Table 2

Schema Richness

Each schema description was divided into units of information. An information unit was defined as a single statement or idea (e.g., "This type of probationer gets into crime because he has some real psychological problems," "A burglar is different from a thief in his degree of professionalism"). Repetitious responses conveying the same meaning were counted as one unit. Each schema from each subject was scored for the number of unique information units it contained.

Table 2 also shows the mean number of information units for each schema for expert and novice POs. Experts provided significantly more information units per schema (M=10.9) than did novices (M=6.2) [t(38)=5.68, $p <$ .001].

-8 -

This effect was equally significant in a regression analysis controlling for schema type and serial response position [$F(1,29)=39.13$, $p<.001$]. It can be seen in Table 2 that experts gave richer schemas for nine of the ten consensual schemas. Among the expert group there was a strong positive relationship between the number of experts invoking a schema and the mean information units [$r(8)=.81$, $p<.01$], but among the novice group this correlation was significantly negative [$r(8)=-.79$, $p<.01$].

These results, along with the previous finding that novices produce more non-consensual schemas, suggest that schemas may be less fully-developed and less functional for novices. It was our impression that novices want to make fine discriminations among individual probationers, and therefore import many social categories from their past experience. Because they have high caseloads, there is little time to devote to each case. Only those categories that consistently seem useful for making treatment and supervisory plans get used and developed as POs gain experience. The schemas evoked most frequently among the novice group (Dumb Hillbilly and Suburb Kid) are types most recently emerging in caseloads, according to officer reports and department statistics. Perhaps these categories are less elaborate and experts are therefore unwilling to present them. Novices also may have responded more strongly to the implicit demand in the researcher's request by producing many low-quality schemas, whereas experts restricted themselves to a few, more complex, schemas.

In conclusion, the results of Study 1 show that there exist at least ten schemas of probationers that are shared across many probation officers. Expert and novice officers differ substantially in which schemas are mentioned and how much information is contained in each schema. However, these results rest on subjective elicitation and coding techniques. It is possible that POs

responded to demand characteristics or that the interviewer read too much into the responses. Study 2 was therefore designed to objectively validate the existence and content of schemas.

STUDY 2

Study 2 examines whether probation officers' reconstructions of case files from items of information will exhibit consensus among officers and consistency with the schemas uncovered in Study 1. In order to test that these schemas are developed through experience and therefore more than commonsense or semantic associations among pairs of items, it is necessary that nonexperts reconstruct cases differently than experts. A card-sorting task similar to that used in Carroll and Wiener (1982) was employed.

Method

Subjects

Twenty probation officers and twenty clerical staff of the Cook County Adult Probation Department were recruited as subjects. The officers had not participated in Study 1. An equal number of expert and novice POs were recruited using the same three-year definition of experience. Within each experience group, equal numbers of Criminal and Municipal officers were contacted. The clerical staff members of the Department formed a non-equivalent control group. These workers do filing, typing, scheduling, and other duties that do not require direct contact with probationers. Although they are familiar with the procedural and legal aspects of probation, there is no reason to believe that they have any expertise regarding the supervision and treatment of probationers, and therefore should not possess elaborate schemas.

Materials

Realistic case information was developed to represent each of the ten schemas of Study 1. This was done by asking ten of the POs from Study 1 to

select real cases that portrayed their previously-described schemas.
Thirty-six actual case files were reviewed and information extracted and
combined to create schematic cases in the style and language of actual files.
Summaries for each schematic case were constructed using seven information
categories: (1) current crime; (2) prior record; (3) demographics, i.e., age,
race, and sex; (4) socio-psychological profile, i.e., mental status,
interpersonal relationships, and attributions about the crime; (5) report
behavior, i.e., demeanor during contacts with the PO; (6) treatment
recommendations; and (7) prognoses, i.e., expected behavior on probation and
the likelihood of continued criminal activity.

Procedure

Each category of information from each schema was typed on a separate 3 x
5 card and placed in piles organized by category. Pilot testing suggested
reducing the magnitude of the task, which was done by dropping the two least
detailed schemas, leaving eight schemas with seven categories of information
each. Pile order and placement were randomized for each subject. Behind the
cards was placed a wooden board three feet high and five feet wide with eight
columns of hooks, each column seven hooks long. The fifty-six hooks were
evenly spaced to hold the fifty-six information cards.

Subjects were scheduled individually. Upon arrival, they were informed
that the purpose of the study was to examine how they organize their caseloads
into different types of probationers. They were told,

> Your task is to put together the cards to form eight
>
> different criminal cases which have been constructed from
>
> interviews with probation officers, actual case files, and
>
> presentence investigations. Every case you assemble should
>
> consist of seven cards—one from each of the information

piles. Start with any pile you wish and choose from the piles in any order you desire... Remember, there is no actual right or wrong way to do it. Rely on your subjective judgments.

During the task, subjects were unobtrusively observed and timed. At the conclusion of the procedure, subjects were asked to discuss their reactions to the task, the strategies they had used to organize the information, why information fit better in some cases than in others, the labels they would put on each of their cases, and the relative prevalence of each case in their caseload. They were also instructed to elaborate on the constructed cases in terms of the five content domains of Study 1. Subjects were then debriefed with an explanation of the purpose of the study and thanked for their participation.

Results and Discussion

All subjects treated the task as meaningful, and reported that the information was realistic and representative of probation cases in Cook County. POs nearly always began a "schema" with offense (93% of 160 schemas); 60% began with the sequence offense-demographics-prior record. This is congruent with the role of POs in Cook County which focuses primarily on monitoring and control. In contrast, no discernable trend in the ordering of information was found among the clerical staff.

Schema Consistency

For each subject, each of the eight a priori schemas from Study 1 (consisting of 7 information items) was matched against each of the constructed cases, resulting in a score from 1 to 7 (number of identical items). The maximum match for each schema was considered a consistency score allowing comparisons among subjects and among schemas. In order to evaluate

consistency against chance levels, forty random subject performances were generated by computer and evaluated in the same manner.

Probation Officers and clerical staff. POs were compared to clerical staff using a 2 (PO vs. staff) X 8 (Schema) repeated-measures ANOVA. Cases formed by POs were significantly more consistent with the schemas (M=4.8 out of a possible 7) than those formed by staff (M=3.1) in forming cases [F(1,38)=59.02, p<.001]. Comparing each subject group against the computer-generated random subjects showed that both groups did significantly better than the chance value of 2.5: ANOVAs yielded values of F=167.22 (p< .001) for the POs and F=33.40 (p<.001) for the clerical staff. This suggests that the clerical staff are doing somewhat better than chance, but that POs are more accurate in their reconstructions of the schemas.

A significant main effect of schema type [F(7,266)=15.70, p<.001] was also found, qualified by a significant interaction of schema with subject group [F(7,266)=5.07, p<.001]. As shown in Table 3, simple main effect tests (Winer, 1971) revealed that POs were significantly more consistent than clerical staff with six of the eight schemas, and slightly more consistent on the other two. Newman-Keuls tests of all schema means revealed all but adjacent means to be significantly different.

INSERT TABLE 3

Experience and assignment. Probation Officers' consistency scores were further analyzed in a 2 (Experience: Expert vs. Novice) X 2 (Assignment: Criminal vs. Municipal) X 8 (Schemas) repeated-measures ANOVA. As shown in Table 3, the analysis revealed a significant main effect of Experience [F(1,16)=8.84, p< .01] with experts more consistent than novices (means of 5.3 and 4.3). A significant main effect of schema type again emerged

[$\underline{F}(7,112)=16.51$, $\underline{p} < .01$] qualified by two significant interactions: Schema X
Assignment [$\underline{F}(7,112)=3.29$, $\underline{p} < .01$] and Schema X Experience [$\underline{F}(7,112)=2.11$, $\underline{p} <$
.05]. Simple effects comparisons on the means given in Table 3 show that
Criminal officers were more consistent with the Gangbanger schema; Municipal
officers were more consistent with the Suburb Kid schema. This finding
appears to be a direct consequence of the differential caseloads of the two
groups and strongly suggests that schemas are better developed for offender
types that are directly experienced during assignment, monitoring, and
treatment. Expert officers were more consistent with five of the eight
schemas than their less-experienced colleagues, a result again supporting the
role of experience in the emergence of schemas.

Cluster Analysis

A second and more inductive way to measure schema consistency was employed
by submitting the card sortings of POs and staff to a cluster analysis, using
the number of subjects sorting two cards into the same case as the clustering
index (Ray, 1982). Results revealed that officers had nine clusters of
information categories (Cubic Clustering Criterion=21.21, $\underline{R}^2=.35$) whereas
clerical staff had a negative clustering score, indicating poor clustering.

The nine empirically-derived clusters were examined in comparison to the
eight schemas of Study 1 and by examining officers' responses to the post-task
questions. Four of the original eight schemas appeared in the new clusters:
White Collar, Female Welfare Fraud, Drug Addict, and Burglar. Three new
schemas could be labelled: Project Black, Barroom Brawler, and Shoplifter.
The remaining two clusters could not be interpreted.

In general, these results strongly support the hypothesis that POs would
construct cases by using their schematically-organized knowledge of offenders,
whereas the clerical staff were forced to rely on a sparse knowledge base of
commonsense and semantic associations among items. The specific content of at

least four of the schemas was validated, both by the high number of matches in Table 3 and by the similarity to the inductive clustering solution. The remaining schemas received less clear support either because they are not as universal among POs (only more experienced officers or those from one assignment have the schema) or because they are less distinctive or discriminable.

Sorting Time

Analyses of the length of time taken to complete the task showed that POs took longer to sort the cards (M=36.5 min) than did clerical staff (M=21.6 min) [t(38)=6.15, p $<$ .001]. Expert officers took longer (M=43.5 min) than did novice officers (M=29.1) [t(18)=5.21, p $<$ .001]. Although research generally finds schema use results in faster responses (Taylor & Crocker, 1981), as does research on greater expertise (Johnson, 1980), it is plausible that in a novel task such as this, experts had to process more prior information (cf. Markus, 1974) and thus took longer. An alternative explanation is that these differences simply represent greater or lesser effort due to ego-involvement.

STUDY 3

Study 3 examined the practical consequences of schema use for probation officers' judgments. Given that Studies 1 and 2 have described and validated schemas of probationers, it is of central importance to the utility of the schema concept that these schemas be used to guide the processing of actual cases. Although we would have preferred to use actual cases in Study 3, for purposes of control we asked expert probation officers to evelute realistic hypothetical cases in ways that reflect their joint role of treatment provider and case monitor. Because such evaluations are highly practiced and the task was administered by a high-ranking "insider," we believe POs made a serious

effort and gave responses comparable to behavioral intentions that are highly predictive of actual behavior (Ajzen & Fishbein, 1980). We hypothesize that these judgments would be made more efficiently for cases fitting a schema: schematic cases, in comparison to cases not fitting a schema, should be processed faster (e.g., Markus, 1977; Markus & Smith, 1981; Kuiper & Rogers, 1979; Taylor, Crocker & D'Agostino, 1978; Lingle & Ostrom, 1977), more easily (e.g., Rosch & Lloyd, 1978), and more confidently (e.g., Cantor et al., 1980; Markus & Smith, 1981; Cohen, 1983).

In evaluating the processing of schematic cases, it is critically important to have an appropriate comparison set of nonschematic cases. The processing advantage of schematic cases is trivialized and uninterpretable if the comparison cases are bizarre or unusually difficult. Our solution to this problem was to have two sets of nonschematic cases: (a) mixed schematic cases each formed by combining parts of two different schematic cases, and (b) real cases selected in a representative fashion. Neither set is a perfect comparison: mixed schematic cases do not conform to schemas but may be peculiar in some way, whereas real cases contain some unknown number of schematic cases. However, the two sets provide a valuable comparison, which was further enhanced by equating the case descriptions on length, reading time, and ratings of plausibility and internal consistency.

Method

Subjects

Twenty expert probation officers, one-half from the Criminal division and one-half from the Municipal division, were recruited. The sample was evenly divided between men and women, whites and non-whites. Officers who had participated in Study 2 were screened out.

Materials

Four schematic cases were selected: Burglar, Drug Addict, Female Welfare Fraud, and White Collar Criminal. These four had the highest level of detail in Study 1, and the most consistency with the clustering task in Study 2. Fuller case histories for each schema were written in the style of Presentence Investigation reports, drawing upon the descriptions of these schemas in Studies 1 and 2 and the representative cases utilized in the development of case materials for Study 2.

Four mixed schematic cases were formed by combining parts of similarly-constructed descriptions of the Suburb Kid, Gangbanger, Uncle Tom, and Con Man schemas. The demographics and crime of the Suburb Kid were mixed with the prior record and socio-psychological profile of the Gangbanger. The obverse parts of these two schemas formed a second case. Two more cases were formed by mixing Uncle Tom and Con Man in the same way. These mixtures were chosen for their plausibility.

Twenty Presentence Investigation reports were randomly selected from approximtely 200 such reports written between 1979 and 1981 and on hand from a previous study. The files of these cases were then checked for other pertinent information so that these 20 real cases could be written with the same content and format as the schematic and mixed schematic cases.

Five employees of the Department whose job requires the reading of case files examined all 28 cases. Measures of total words per case, mean sentence length and complexity, level of vocabulary, and reading time were obtained from these subjects. Two of the subjects also provided ratings of the cases on their verisimilitude or similarity to actual cases, and their internal

consistency or plausibility, both on seven-point scales. Interjudge reliability on these two scales were $r=.85$ and $r=.79$, respectively. ANOVAs revealed no differences among the three types of cases on reading time, verisimilitude, or plausibility. Minor changes were made to nine of the cases on the basis of comments by these five subjects.

Procedure

Each subject received a unique set of four cases: two schematic, one mixed schematic, and one real. Hence, each schematic case was evaluated by ten subjects, each mixed schematic by five, and each real case by one. Pairings were random, as was the order of cases for each subject, and the assignment of sets to subjects.

Subjects were told that their task was to carefully read and evaluate four actual criminal cases for the purpose of making a number of judgments that are comparable to the assessments they make in their daily activities as POs. Prior to evaluating the four cases, subjects completed a schematic practice case in the same format using the same procedures and questions. Four key questions were asked about each case: cooperativeness during contacts, regularity in reporting on assigned days, and likelihood of successfully completing the sentence, each on a seven-point scale, and an open-ended request for a list of extra-departmental referrals for the case and a discussion of the counseling and monitoring strategies the PO would use with the case. Although these questions are not equivalent to taking action on an actual case, they tap the judgments and behavioral intentions (cf. Ajzen & Fishbein, 1980) that POs consider essential to their role (Lurigio, 1981). After each of the four questions, subjects were asked to rate their confidence in the accuracy of their response and the difficulty of answering the question

(on seven-point scales). Time taken to anwer each question was recorded surreptitiously for each case, excluding reading time. In addition, each subject rated each case on a seven-point scale of typicality (from not at all to highly similar to their caseload).

After completing all four cases, subjects were debriefed. No subject expressed suspicion about the actual purpose of the study nor any prior knowledge about the study. Officers stated they had been unaware that response times were being recorded. Respondents were thanked for their participation and asked not to discuss the study until it was completed.

Results and Discussion

We expected that schematic cases would be rated as more typical than non-schematic cases. This is as close to a manipulation check as we obtained. As shown in Table 4, a one-way repeated-measures ANOVA revealed that case types were significantly different [$\underline{F}(2,38)=27.35$, $\underline{p} < .001$] and post-hoc Neuman-Keuls comparisons yielded significant differences only between schematic cases and other types. Schematic cases were rated highly typical (6.4 on a 7-point scale) whereas non-schematic cases were rated moderately typical (4.6 and 4.8). Note that typicality ratings for the two schematic cases examined by each subject were averaged and compared to the single mixed case and single real case.

INSERT TABLE 4

Confidence and Ease

Each subject gave confidence and difficulty ratings for four questions pertaining to each case. These were averaged so that each subject had one score for each case type. Results are given in Table 4. One-way

repeated-measures ANOVAs revealed that POs ratings of confidence were significantly higher for schematic cases than for mixed schematic or real cases [$F(2,38)=32.41$, $p < .001$]. Post-hoc tests using Newman-Keuls procedure revealed significant differences only for the schematic cases compared to other cases. POs rated schematic cases significantly lower on difficulty than mixed cases or real cases [$F(2,38)=7.98$, $p < .01$], but post-hoc tests indicated that mixed cases were significantly more difficult to judge than either of the other types. Ratings of confidence and difficulty were significantly negatively correlated (r of -.36, -.41, and -.49) for the three case types. No significant differences in confidence or difficulty were found among the four schematic cases or among the mixed cases (all $Fs < 1$).

Response Time

Response times were recorded to the nearest minute beginning with the presentation of each question and ending when the subject indicated that he or she had completed the task. The results given in Table 4 showed that schematic cases were processed more quickly than mixed schematic and real cases [$F(2,38)=34.68$, $p < .001$]. All three types of cases were significantly different from one another by Newman-Keuls procedures. This is consistent with earlier results showing that schematic cases were rated more confidently than the other two types of cases, and that the mixed schematic cases were considered the most difficult to evaluate.

Response times were correlated with ratings of confidence and difficulty. Response times and difficulty were significantly positively correlated for each of the three types of cases (r of .43, .51, and .38). The results are more complex for confidence. POs were somewhat more confident when they responded more rapidly to schematic cases ($r = -.24$, n.s.) but less confident

when they responded more rapidly to nonschematic cases (r=.65 and .57, $p <$ .01). We can interpret these results by hypothesizing that, when accessing a schema, faster judgments indicate a clear and rapid match with a schema and retrieval of relevant information, and consequently high confidence (cf. Pachella, 1974). However, when schematic processing fails, judgments based on more extensive information retrieval from memory, which takes more time (cf. Sternberg, 1969), may produce greater confidence.

GENERAL DISCUSSION

The present research provides evidence that Probation Officers' knowledge about probationers is structured schematically and that these schemas are used to interpret and respond to cases. In Study 1, ten schemas were described that included information about criminal behavior, physical description and personality, social histories, causal attributions about criminal behavior, summaries of appropriate treatment and supervision strategies, and prognoses for future behavior. Study 2 showed that these schemas were not artifacts of the interview procedure in Study 1, nor were laypeople able to reproduce them. Comparisons of expert and novice POs demonstrated that schemas become more detailed, more meaningful, and better articulated with experience. Study 3 showed that cases fitting a schema were processed more quickly, more easily, and more confidently than cases not fitting a schema. Our discussion will focus on several issues: (a) cognitive efficiency and effectiveness, (b) the nature of expertise, (c) systematic categorization rules, and (d) future research, or "what is not a schema?"

Cognitive Efficiency and Effectiveness

The schematic processing of criminal cases by POs provides a reasonable level of sophistication of judgment within the limitations of cognitive capacities. Cases are treated neither as all alike nor as all unique. In

evaluating and applying the voluminous information about each probationer, POs' use of schemas offers cognitive economy (Fiske & Kinder, 1981) by structuring redundant cases (Cantor & Mischel, 1979). Thus, as shown in Study 3, routine decisions about counseling techniques, report modality or frequency, and responses to violations are made more quickly and confidently because ready-made inferences can be accessed as part of the schemas rather than constructed from scratch for each case. Precious cognitive resources can then be allocated to complex or novel (non-schematic) cases.

However, schematic processing may sometimes be a costly economy. If the true regularity among probation cases is less than that encompassed by schemas, or if POs are less reliable in sorting cases into schemas than they are in making unique intuitive assessments, then schematic processing will increase the errors made in evaluating cases. Ascription of schematic features to cases that do not fit the schema may result in the use of inappropriate treatment and supervision strategies. If POs use schemas to generate hypotheses about probationers, and then search for confirming evidence in the case information (cf., Snyder, 1981; Snyder, & Swann, 1978), they will be prevented from acquiring new information about individual cases and new types of cases, including making necessary revisions in their schemas. Thus, Type I errors in schematic processing may inhibit learning (cf., Einhorn, 1980). In the next section we discuss what we think expert POs have learned.

Expertise and the Development of Schemas

The present research has demonstrated several significant differences between Probation Officers and laypeople, between expert (three or more years experience) and novice POs, and between POs in the Criminal and Municipal divisions who encounter somewhat different case types. It is clear that the

schemas we have investigated are developed, at least in part, from direct experience with probation cases. We can, therefore, make some useful statements about what it means to be an expert. Experts know more, but equally as important, their knowledge is more usable because it is more structured. Experts organize their knowledge to reach a higher level of both efficiency and accuracy. Sometimes experts are faster than novices because they have organized their knowledge schematically (and because they process information schematically); but sometimes they are slower because they have more relevant information to consider. Sometimes experts are more accurate than novices because their schemas are valid representations of a domain, but experts are embarassingly likely to have incorrect or commonsensical schemas (e.g., Chapman & Chapman, 1967).

Our finding that experienced POs have fewer but more detailed schemas than do novice POs suggests an interesting form of schema development. Rather than simply adding schemas as new experiences were accumulated, experienced POs seem to have weeded out many useless stereotypes and enriched a smaller number of useful schemas. Such schema modification was likely in response to repeated incongruous information across many different cases, a process Weber and Crocker (1983) called "bookkeeping."

Systematic Categorization Rules

Probation authorities, parole authorities, judges, and other criminal justice decision makers have recently instituted various mechanisms for structuring decisions by using systematic rules, procedures, or guidelines (e.g., Gottfredson, Wilkins, & Hoffman, 1978). These efforts are due to both internal pressures for improved classification and treatment strategies, and external criticism regarding the ineffectiveness and apparent arbitrariness of criminal justice decisions. New classification typologies (e.g., Megargee &

Bohn, 1979) are based on the assumption that a structured screening process will permit more consistent, accurate, and equitable decision making.

The fact that subjective classification systems (schemas) already exist has several implications for the development and implementation of systematic classification policies. First, if the schemas have some validity, they may serve as a useful starting point for the development of assessment devices. They are, after all, based on the experience and expertise of the probation staff. Using POs' own knowledge and terminology may not only provide useful information, but also gain necessary cooperation and enhanced acceptance. Guidelines that are forced on users, are not directed at a felt need, and fail to deal with the concerns of the users, tend to be ignored (Gallegher & Carroll, 1983). Second, if schemas contain false information, they cannot simply be ignored with the hope that POs will stop using their own knowledge. Instead, procedures must be adopted to bring schemas to the surface, acknowledge their existence and content, and demonstrate to the officers' satisfaction where and how the schemas are in error.

Schema Research

We have utilized two precedural innovations in our schema research. First, we elicited schemas directly from subjects using a semi-structured interview (but note that the results were validated with different subjects and different tasks). Our success with this procedure rests on two points: (a) our subjects were professionals with a great deal of experience in a domain that is highly repetitive and highly verbal. This suggests that their schemas would be more available and articulable than for other subjects; and (b) the authors were highly conversant with the subject matter, procedures, and terminology of probation (but did not know what the schema content would turn

out to be). This meant that they could design a meaningful interview
schedule, establish a high degree of rapport with subjects, and interpret
responses.

Second, we included necessary controls to test the schema approach. In
Study 2, a comparison group of laypeople was identified who should not have
had the schemas; indeed, they did not. The development of "non-schematic"
cases in Study 3 was undoubtedly the most difficult aspect of the research.
It is too easy to develop non-schematic cases that are improbable or "wrong"
in some way. The "effect of schemas" may then become the difficulties of
processing the non-schematic cases rather than the ease of processing the
schematic cases. We tried to ensure that non-schematic cases would be matched
to schematic cases in length, reading time, complexity, style, consistency,
realism, and so forth. We used two different types of non-schematic
cases--some constructed from bits of different schematic cases, the others
selected from actual cases. We hoped that the actual cases would not contain
schematic cases, and that the constructed cases would be "normal." This is
only an interim solution to the problem of defining what is not schematic yet
still part of the domain of interest. Our results suggest that the use of two
comparison sets was valuable and increases our confidence that we studied
actual schemas.

In the future, we feel the study of schemas in real-world domains, some of
which have experts, and the effects of schematic processing on relevant
decisions, will be of increased importance. For the development of theory,
such research offers the potential to study the growth and change of schemas,
the effects of complexity of the domain, and the way accurate and inaccurate
learning occurs. For application, descriptions of schemas and assessments of
their accuracy are essential directions. Attempts to develop new decision

aids can build on the schema concept, the natural organization of knowledge, and must deal with the intuitive knowledge base that may have to be altered or replaced by objective scientific knowledge.

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TABLE 1

Schemas of Probation Officers

1. BURGLAR - early 30's, married, any race, intelligent, extensive burglary record, professional - expert, very poor prognosis (set lifestyle).

2. DRUG ADDICT - early 20's, black, unintelligent, uneducated, lacking any social skills, parasite - uses people, varied crime background, crime to support habit, poor prognosis, some hope in a program.

3. GANG BANGER - under 21, Hispanic, cocky at first, gang involvement causes crime, needs lots of supervision, prognosis good - matures out of gang activities.

4. UNCLE TOM - 40-60's, black, sporadic history of petty crimes, crime by impulse, excellent prognosis - fears prison, respectful - cooperative.

5. FEMALE WELFARE FRAUD - 20's, black woman, unmarried but involved with male who controls her life. Easily manipulated, feels forced to crime through concern for kids or her man. Prognosis guarded to good depending on getting her away from the man.

6. CAREER CRIMINAL (CON-MAN) - black, well-dressed, street-smart, manipulative. Bad person, unreachable, no concern for others. Extensive diverse criminal history. Prognosis very bad.

7. VIOLENT MACHO MAN - 20's, Hispanic. Short fuse - walking time bomb. Assualts and bar fights when manhood challenged. May act out in supervision. Prognosis - no change.

8. SUBURBAN KID - teens. Minor first offense. Good kid in bad crowd. Contrite. Parents heavily involved in case. Prognosis excellent.

9. DUMB HILLBILLY - Dumb, very easily influenced, impulsive. Many petty crimes. Cooperative. Prognosis - guarded if controlled by P. O.

10. WHITE-COLLAR CRIMINAL - White, 35-45, middle class. Employed, family, businessman. Looking for a fast buck, irresistible impulse. Drug dealing. Not a criminal type. Prognosis excellent. Cooperative although insulted by this process.

TABLE 2

Number Reporting the Schema Types and
Mean Information Units by Experience

Schema Type	Number Reporting		Information Units	
	Expert	Novice	Expert	Novice
Burglar	14	6*	14.3	9.4[b]
Drug Addict	10	10	12.8	4.7[b]
Gangbanger	12	4*	12.7	8.3[a]
Uncle Tom	10	4	11.7	9.9
Female Welfare Fraud	9	5	9.9	5.7[a]
Career/Con Man	5	9	5.3	4.3
Violent/Macho Man	4	10	6.2	4.2
Suburb Kid	3	11*	8.9	5.1[a]
Dumb Hillbilly	3	11*	9.9	6.1[a]
White Collar	8	5	10.8	11.3

*$p < .05$ by $X^2(1)$ [a]$p < .05$ [b]$p < .01$

TABLE 3

Mean Schema Matches By Group,

Expertise, and Assignment

	Group		Experience		Assignment	
	Officers	Clerical	Expert	Novice	Criminal	Municipal
Burglar	5.4*	3.6	6.1*	4.6	5.3	5.4
Drug Addict	5.6**	3.0	6.4*	4.9	6.0	5.3
Gangbanger	4.0	3.3	3.9	4.2	5.0**	3.1
Uncle Tom	3.5	2.8	4.2*	2.8	3.5	3.5
Female Welfare						
Fraud	5.8**	3.7	6.3	5.3	6.0	5.6
Suburb Kid	4.7**	3.0	4.6	4.8	4.1*	5.3
Dumb Hillbilly	3.4	2.5	4.0*	2.8	3.2	3.6
White Collar	6.0**	3.3	6.6*	5.3	5.7	6.2

Note: Tests refer to adjacent means only, e.g., Officers vs. Clerical.

*$p < .05$

**$p < .01$

TABLE 4

Mean Typicality, Confidence, Difficulty, and Response Times
of Schematic, Mixed Schematic, and Real Cases

	Case Types		
	Schematic	Mixed	Real
Typicality	6.4^a	4.6^b	4.8^b
Confidence	6.4^a	5.0^b	4.8^b
Difficulty	1.6^a	2.3^b	1.9^a
Response Time (min.)	3.8^a	6.9^c	5.2^b

Note: Case types with same superscript do not differ significantly by
Newman-Keul's test.

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